

## **Prevalence of Vitamin D Deficiency among Sudanese Ladies with Secondary and Primary Infertility**

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### **Original Research Article**

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**Abstract:** Vitamin D is so essential to fertility and getting pregnant is because it is needed to help the body create sex hormones. There is no published about the association between vitamin D deficiency and infertility among Sudanese ladies with infertility disorders. To know the prevalence of vitamin D deficiency among Sudanese women with infertility disorders. To know the prevalence of vitamin D deficiency among women with secondary infertility in comparison to those with primary infertility disorders. Descriptive, cross-sectional study, applied immunoassay to measure vitamin D level among the participant ladies. 64.5% of infertile ladies showed vitamin D deficiency. 18.8% of ladies with secondary infertility showed vitamin D deficiency compared to 45.7 %among ladies with primary infertility disorders. Further study should be done with large sample size and more than one method should be applied to measure vitamin D in order to obtain more accurate results.

**Keywords:** vitamin D, deficiency, female's infertility.

### **INTRODUCTION**

Vitamin D is a necessary vitamin for the growth and development of bones. Vitamin D is commonly known as ergocalciferol (Vitamin D2) and cholecalciferol (Vitamin D3). Vitamin D2 and D3 are broken down to their active form, calcitriol, in the body. Calcitriol works by increasing absorption of calcium and phosphorus in the body. Calcitriol also prevents loss of calcium and phosphorus from kidneys so they are absorbed back in the body to maintain sufficient levels [1].

Vitamin D is known as the sunshine vitamin because our bodies can actually make and absorb vitamin D from sun exposure. 5 – 30 minutes of sun exposure between 10 am and 3 pm twice a week to the face, arms, legs, or back without sunscreen is usually enough to help boost vitamin D intake.

This process varies widely depending on the season, time of day, cloud cover, skin color, and sunscreen use, so eating food sources of vitamin D (such as fortified dairy products, or some mushrooms) is also important[2].

Only 20% of our vitamin D is meant to come from our diet with the remaining 80% provided by our skin from UV-B exposure to the sun [3].

### **Causes of vitamin D deficiency**

It's worth repeating that 50 percent to 90 percent of most people's vitamin D comes from casual sunlight exposure. Your skin makes vitamin D when it comes in contact with the ultraviolet B (UVB) rays from the sun. Therefore one of the biggest reasons that a growing population is experiencing vitamin D deficiency symptoms is because of our modern,

primarily indoors lifestyle. This contributes to the two most common causes of vitamin D deficiency:

### **Lack of Sun**

While years ago people spent more time outdoors, walking to do errands and even working outside, today we see a different situation. Most children spend unprecedented hours inside — watching television, playing video games and surfing the internet. Similarly, most adults work indoors, exercise inside gyms and spend their free time inside their homes where they are sheltered from the sun.

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### Sunscreens

Not only are we failing to get enough time outdoors in the sun, but when we do, many of us wear sunscreen nearly the entire time. As the risk for developing skin cancer has also risen in recent years, doctors strongly encourage the use of sunscreen for children and adults, even through the winter months and when sun exposure is generally limited.

Research also shows that certain health conditions, such as abdominal obesity, type 2 diabetes, insulin resistance and hypertension, also increases a person's risk of vitamin D deficiency [4].

### Signs and symptoms of vitamin D deficiency

1. Getting Sick or Infected Often:  
One of vitamin D's most important roles is keeping your immune system strong so you're able to fight off the viruses and bacteria that cause illness. It directly interacts with the cells that are responsible for fighting infection. If you become sick often, especially with colds or the flu, low vitamin D levels may be a contributing factor. Several large observational studies have shown a link between a deficiency and respiratory tract infections like colds, bronchitis and pneumonia.
2. Fatigue and Tiredness:  
Feeling tired can have many causes and vitamin D deficiency may be one of them.
3. Bone and Back Pain:  
Vitamin D is involved in maintaining bone health through a number of mechanisms. For one, it improves your body's absorption of calcium.
4. Depression:  
A depressed mood may also be a sign of deficiency.
5. Impaired Wound Healing:  
Slow healing of wounds after surgery or injury may be a sign that vitamin D levels are too low.
6. Bone Loss:  
Vitamin D plays a crucial role in calcium absorption and bone metabolism.
7. Hair Loss:  
Hair loss is often attributed to stress, which is certainly a common cause. However, when hair loss is severe, it may be the result of a disease or nutrient deficiency. Hair loss in women has been linked to low vitamin D levels.
8. Muscle Pain [5].  
Vitamin D deficiency and infertility:  
It's important for our health and fertility to make sure we get plenty of nutrients into our bodies, each vitamin and mineral is important in its own right. But vitamin D and fertility have a special

connection – many studies have shown that women dealing with infertility often have low levels of this vitamin. And traditional cultures revered special foods as “fertility foods” for young couples, many of them high in vitamin D [6].

However, the reason it is so essential to fertility and getting pregnant is because it is needed to help the body create sex hormones [7].

In study done by Luca Pagliardini *et al.* indicated that in a cohort of female patients attending an infertility center in Northern Italy, levels of serum 25(OH)D follow a seasonal cycle; as a whole, over the entire year, 40.1% of patients showed deficient[8].

### Justification

There is no published about the association between vitamin D deficiency and infertility among Sudanese ladies with infertility disorders.

### Objectives

#### General objectives

To know the prevalence of vitamin D deficiency among Sudanese women with infertility disorders

#### Specific objectives

To know the prevalence of vitamin D deficiency among women with secondary infertility in comparison to those with primary infertility disorders

### MATERIALS AND METHODS

#### Study design

Descriptive, cross sectional study

#### Study period

March-May, 2018

#### Study population

Sudanese ladies with known infertility disorders

#### Sample size

138 Sudanese ladies with infertility disorders

#### Data collection

Data was collected through well instructed questionnaire; contain the entire patient's required information.

#### Ethical approval

All patients were informed about the objective of the study and they consent to be involved in it.

#### Method

#### Sample

Venous blood was collected from each participant.

Instrument used to assay vitamin D:  
VIDAS 25OH Vitamin D total assay (VITD)

### Principle

The assay principle combines an enzyme immunoassay competition method with a final fluorescent detection (ELFA).

The solid phase Receptacle (SPR) serves as the solid phase as well as the pipetting device for the assay. Reagents for the assay are ready-to-use and pre – dispensed in the sealed reagent strips.

All of the assay steps are performed automatically by the instrument. The reaction medium cycled in and out of the SPR Several times.

The sample is mixed with pre-treatment reagent to separate vitamin D from its binding protein. The pre-treated sample is then collected and transferred into the well that contains an alkaline phosphatase (ALP) labeled anti-vitamin D antibody (conjugate).

The vitamin D antigen present in the sample and the vitamin D antigen coating the anterior of the SPR complete for binding sites on the anti-vitamin D antibody-ALP conjugate.

During the final detection step, the substrate (4-Methyl-umbelliferyl phosphate) is cycled in and out of the SPR.

The conjugate enzyme catalyzes the hydrolysis of this substrate into a fluorescent product (4-Methyl-umbelliferone), the fluorescence of which is measured at 450 nm. The intensity of the fluorescence is inversely proportional to the concentration of vitamin D antigen present in the sample. At the end of the assay, results are present in the sample. At the end of the assay, results are automatically calculated by the instrument in relation to the calibration curve stored in memory, then printed out.

### RESULTS

64.5% of infertile ladies showed vitamin D deficiency. 18.8% of ladies with secondary infertility showed vitamin D deficiency compared to 45.7 %among ladies with primary infertility disorders.

### DISCUSSION

Our result showed strong relation between vitamin D deficiency and females infertility disorders (64.5%) while 40.1% of patients showed deficient in Luca Pagliardini et al, study among Italian ladies.

### CONCLUSION

Further study should be done with large sample size and more than one method should be applied to measure vitamin D in order to obtain more accurate results.

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